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CLAIMS

[Claim(s)]

[Claim 1] In the developer which has developer support and a pivotable developer supply means to contact or approach this developer support, and supplies 1 component developer to said developer support with this developer supply means Between the wall surfaces which the development container which holds said developer supply means in the downstream and said 1 component developer of a hand of cut of said developer supply means from the contact section or the contiguity section of said developer support and said developer supply means counters The developer characterized by preparing the developer migration prevention member which prevents that a developer moves in the direction of the exterior of said development container through between the wall surfaces which said developer supply means and said development container counter.

[Claim 2] Said developer migration prevention member is the developer of claim 1 characterized by being the member of the shape of the shape of a film, and a sheet.

[Claim 3] Between the wall surfaces which said developer supply means in the downstream of the hand of cut of said developer supply means and said development container counter from the contact section or the contiguity section of said developer support and said developer supply means, it is the developer of claim 1 characterized by being formed in the 1000 times [10 to] as many minute opening of the diameter of a developer as this.

[Claim 4] Said minute opening is the developer of claim 3 characterized by being large gradually as it goes to the downstream of the hand of cut of said developer supply means.

[Claim 5] In the developer which has developer support and a pivotable developer supply means to contact or approach this developer support, and supplies 1 component developer to said developer support with this developer supply means Between the wall surfaces which the development container which holds said developer supply means in the downstream and said 1 component developer of a hand of cut of said developer supply means from the contact section or the contiguity section of said developer support and said developer supply means counters The developer to which the magnetic substance which counters a field generating means and this field generating means is prepared, and a developer is characterized by preventing moving in the direction of the exterior of said development container through between the wall surfaces which said developer supply means and said development container counter by collaboration with these fields generating means and the magnetic substance.

[Claim 6] Said field generating means is the developer of claim 5 characterized by being arranged inside said developer supply means.

[Claim 7] The developer characterized by establishing the electric-field means forming which forms the electric field for transferring a developer from said developer support to said developer supply means side in the developer which has developer support and a pivotable developer supply means to contact or approach this developer support, and supplies 1 component developer to said developer support with this developer supply means.

[Claim 8] The developer of claim 7 characterized by forming said electric field for transferring a developer from said developer support to said developer supply means side in the downstream of the

hand of cut of said developer supply means from the contact section or the contiguity section of said developer support and said developer supply means.

[Claim 9] Claim 7 characterized by forming further the electric field which arrange the electrode which counters said developer supply means in the wall surface which the development container which holds said 1 component developer counters, and go to said developer supply means side from this electrode, or 8 developers.

[Claim 10] The developer of claim 9 characterized by arranging further the electrode which counters said developer support in the wall surface which the development container which holds said 1 component developer counters.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the developer which can obtain a high-definition image especially using 1 component developer about the developer which develops and forms into a visible image the electrostatic latent image formed of an electrophotography method, electrostatic recording, etc. on image support.

[0002]

[Description of the Prior Art] Conventionally, in image formation equipments, such as an electrophotography method, and an electrostatic recording copying machine, a printer, the developer which uses the developer (a toner is called hereafter) of nonmagnetic 1 component or magnetic one component is often used. An example of the developer of the conventional 1 component developer method currently used for the image formation equipment of an electrophotography method is shown in drawing 15.

[0003] This developer equips the part which counters the photo conductor drum 101 with the development container 102 which has opening 103, and a toner is held in the interior of this development container 102 so that it may illustrate. Moreover, in the development container 102, as it exposes to the above-mentioned opening 103 in part, the conductive developer support (a development sleeve is called hereafter) 110 is arranged pivotable, and it rotates in the direction of a graphic display arrow head at the time of development actuation, and it conveys towards the photo conductor drum 101, supporting a toner.

[0004] The development sleeve 110 sets the photo conductor drum 101 and a 50-500-micrometer gap, and is held, and the development field for turning to the photo conductor drum 101 the toner currently supported by the development sleeve 110, and supplying it is formed. Furthermore, the feed roller 112 for supplying the toner conveyed by the conveyance means 111 to the development sleeve 110 is held in the development container 102.

[0005] The development bias voltage which superimposed direct current voltage and alternating voltage from bias power supply 106 at the time of development actuation is impressed to the development sleeve 110.

[0006] Above the development sleeve 110, the blade 113 which regulates the thickness of the toner currently supported by the development sleeve 110 is arranged. This blade 113 is attached in the development container 102. Moreover, under the development sleeve 110, the blowdown prevention sheet 108 for preventing the blowdown of the toner from the lower part of the development container 102 to the exterior is formed.

[0007] At the time of development actuation, the conveyance means 111 is turned to a feed roller 112, and conveys a toner, and a toner is applied to the development sleeve 110 by the feed roller 112 which rotates in the direction of a graphic display arrow head. The development sleeve 110 is rotated in the direction shown by the drawing Nakaya mark, and after the toner currently supported by this development sleeve 110 is regulated by thickness predetermined with a blade 113, it is sent to the photo

conductor drum 101 and the above-mentioned development field which counters. In this development field, electric field are formed of the development bias supplied to the development sleeve 110 from bias power supply 106, the electrostatic latent image on the photo conductor drum 101 turns a toner to the part currently formed from the development sleeve 110, it flies and adheres and an electrostatic latent image is formed into a visible image by this electric field.

[0008] On the other hand, electric field are made to act so that a toner may be transported to the development sleeve 110 side from a feed roller 112 between a feed roller 112 and the development sleeve 110, and the configuration with which it was made for a toner to tend to adhere to the development sleeve 110 is conventionally proposed as indicated by JP,3-21906,B or JP,2-21589,B.

[0009]

[Problem(s) to be Solved by the Invention] however, in the conventional developer shown in the above-mentioned drawing 1515 If the development sleeve 110 is turned caudad, and the development container 102 is vibrated as an arrow head D shows as shown in drawing 2 It passed easily, moved in the space A between the bottom wall surfaces of a feed roller 112 and the development container 102, and the blowdown prevention sheet 108 was reached, while making this prevention sheet 108 transform, the toner fell from the development container 102, and the toner in the development container 102 had the fault of soiling a perimeter. Moreover, when a toner was nonmagnetic, even if it carried out development actuation, in order that the toner which exists in the about 108 blowdown prevention sheet space B might not be conveyed by the development sleeve 110 but a toner might accumulate it in this part B, it had become the factor which degrades image quality by condensation of a toner etc.

[0010] Moreover, in the conventional developer, the feed roller 112 had the following faults in order to operate so that a toner may always be supplied to the development sleeve 110.

[0011] 1) Although a new toner is supplied by the feed roller 112 in the part which did not circulate through the toner on the development sleeve 110, but the toner on the development sleeve 110 moved onto the photo conductor drum 101, since a toner is fixed on the development sleeve 110, the property (the amount of TORIBO) of a toner changes and a ghost image is formed in the part (toner free space) which is not moved on the development sleeve 110.

[0012] 2) The force of making a toner always going to the development sleeve 110 side from a feed roller 112 works, it becomes the operation from which a toner is isolated from a feed roller 112, and toner scattering arises. If a toner is especially accumulated in the contiguity section between the bottom wall surfaces of a feed roller 112 and the development container 102, there will be no conveyance of a toner, a toner will condense and fogging etc. will arise in an image.

[0013] One object of this invention the wall surface of the development container which counters the developer supply means and this developer supply means of supplying a developer to developer support therefore, by preparing a sheet metal-like developer migration prevention member in the space between the wall surfaces of contiguity or this developer supply means, and a development container It is offering the developer which prevented the developer in a development container having moved in the direction of the exterior of a development container in the space between the wall surfaces of the above-mentioned developer supply means and a development container.

[0014] Other objects of this invention form a field generating means in the interior of a developer supply means to supply a developer to developer support. And by preparing the magnetic sheet metal-like member which sticks to a developer supply means by the magnetism of this field generating means in the wall surface of the development container which counters this developer supply means It is offering the developer which prevented the developer in a development container having moved in the direction of the exterior of a development container in the space between the wall surfaces of the above-mentioned developer supply means and a development container.

[0015] The object of further others of this invention is offering the developer gives the force which strips off the developer on developer support in an operation of electric field to a developer supply means supplying a developer to developer support, and make hold this ***** developer for a developer supply means, and it was made to make release within a development container.

[0016]

[Means for Solving the Problem] The above-mentioned object is attained by the developer concerning this invention. If it summarizes, it will set in the 1st mode. This invention In the developer which has developer support and a pivotable developer supply means to contact or approach this developer support, and supplies 1 component developer to said developer support with this developer supply means Between the wall surfaces which the development container which holds said developer supply means in the downstream and said 1 component developer of a hand of cut of said developer supply means from the contact section or the contiguity section of said developer support and said developer supply means counters It is the developer characterized by preparing the developer migration prevention member which prevents that a developer moves in the direction of the exterior of said development container through between the wall surfaces which said developer supply means and said development container counter.

[0017] Moreover, set in the 2nd mode and this invention has developer support and a pivotable developer supply means to contact or approach this developer support. In the developer which supplies 1 component developer to said developer support with this developer supply means Between the wall surfaces which the development container which holds said developer supply means in the downstream and said 1 component developer of a hand of cut of said developer supply means from the contact section or the contiguity section of said developer support and said developer supply means counters The magnetic substance which counters a field generating means and this field generating means is prepared. It is the developer to which a developer is characterized by preventing moving in the direction of the exterior of said development container through between the wall surfaces which said developer supply means and said development container counter by collaboration with these fields generating means and the magnetic substance.

[0018] Furthermore, in the developer which it sets in the 3rd mode, and this invention has developer support and a pivotable developer supply means to contact or approach this developer support, and supplies 1 component developer to said developer support with this developer supply means, it is the developer characterized by establishing the electric-field means forming which forms the electric field for transferring a developer from said developer support to said developer supply means side.

[0019]

[Example] Hereafter, the example of this invention is explained to a detail with reference to an accompanying drawing.

[0020] Drawing 1 is the outline sectional view showing the 1st example of the developer by this invention with a photo conductor drum. The developer of this example also equips the part which counters the photo conductor drum 101 with the development container 102 which has opening 103, and a toner (1 component developer) is held in the interior of this development container 102 so that it may illustrate. Moreover, in the development container 102, as it exposes to the above-mentioned opening 103 in part, the conductive development sleeve 110 is arranged pivotable and it rotates in the direction of a graphic display arrow head at the time of development actuation, and it conveys towards the photo conductor drum 101, supporting a toner.

[0021] The development sleeve 110 sets the photo conductor drum 101 and a 50-500-micrometer gap, and is held, and the development field for turning to the photo conductor drum 101 the toner currently supported by the development sleeve 110, and supplying it is formed. Furthermore, the feed roller 112 for supplying the toner conveyed by the conveyance means 111 to the development sleeve 110 is held in the development container 102.

[0022] The development bias voltage which superimposed direct current voltage and alternating voltage from bias power supply 106 at the time of development actuation is impressed to the development sleeve 110.

[0023] Above the development sleeve 110, the blade 113 which regulates the thickness of the toner currently supported by the development sleeve 110 is arranged. This blade 113 is attached in the development container 102. Moreover, under the development sleeve 110, the blowdown prevention sheet 108 for preventing the blowdown of the toner from the lower part of the development container 102 to the exterior is formed.

[0024] The part by the side of the development sleeve 110 of the wall surface (base) of the development container 102 bottom which counters the feed roller 112 which supplies a toner to the development sleeve 110 in this example Make it project to a feed roller 112 side, and between the bottom wall surfaces of a feed roller 112 and the development container 102 is made to approach so that it may illustrate. And the toner migration prevention sheet 103 is formed in the bottom wall surface of this development container 102 made to project. The point of this toner migration prevention sheet 103 is made to contact this feed roller 112 in the mode along the hand of cut of a feed roller 112, and the toner migration prevention sheet 103 closes the space A where it approached between the feed roller 112 and the development container bottom wall surface.

[0025] When the toner in the development container 102 tends to move in the developer blowdown prevention sheet 108 direction, this toner migration prevention sheet 103 That point is in contact with the feed roller 112 in the mode of the graphic display forced on a feed roller 112. This sake, The toner in the development container 102 cannot pass along the space A where it approached between the feed roller 112 and the development container bottom wall surface, but it becomes impossible to move in the blowdown prevention sheet 108 direction. Moreover, a toner is not accumulated in Space A.

[0026] Since it is in contact with the feed roller 112 in the mode which the above-mentioned toner migration prevention sheet 103 mentioned above even if it vibrated the development container 102, as the development sleeve 110 was caudad turned as shown in drawing 2 on the other hand, and an arrow head D showed, as the arrow head C in drawing shows the toner in the development container 102 with gravity, it goes into the toner migration prevention sheet 103, and the point of this toner migration prevention sheet 103 is pushed to a feed roller 112. Therefore, a development container 102 will be in the condition were divided by the feed roller 112 and the toner migration prevention sheet 103, and does not produce at all the fault which the toner in the development container 102 cannot pass through the space A where it approached between the bottom wall surfaces of a feed roller 112 and the development container 102, but reaches the blowdown prevention sheet 108, and makes transform this sheet 108, and the fault of a toner dispersing from a development container 102 and soiling a perimeter.

[0027] Therefore, since it does not join the development sleeve 110 or a feed roller 112 with an unusual working pressure with the condensation of a toner or are recording toner accumulated in this Space B and space A between the bottom wall surfaces of a feed roller 112 and the development container 102, without accumulating a toner in the about 108 blowdown prevention sheet space B while degradation of a toner is prevented, the fault of degrading image quality is also removable.

[0028] The toner which remained on the feed roller 112, without carrying out a deer, and the toner which is not contributed to development on the development sleeve 110 being stripped off by the feed roller 112, and being applied to the development sleeve 110 is returned into the development container 102 with this stripped-off toner. In this case, in the developer of this example, all the toners on a feed roller 112 depressing the point of the above-mentioned toner migration prevention sheet 103, and being returned into the development container 102 was checked. For this reason, the about 108 blowdown prevention sheet space B and the space A between the bottom wall surfaces of a feed roller 112 and the development container 102 are not covered with a toner, therefore degradation of a toner is not caused.

[0029] In this example, the sheet of PET (polyethylene terephthalate) and PVdF (polyvinylidene fluoride) or aluminum (aluminum), SUS (stainless steel), and the good result mentioned above using the copper (Cu) metallic foil were obtained as a toner migration prevention sheet 103. Of course, a toner migration prevention sheet is not limited to these ingredients. Moreover, what is necessary is just the member of the shape of sheet metal (Japanese tissue), such as a sheet-like object, a film-like object, and a foil-like object.

[0030] Next, it explains, raising a concrete numeric value with reference to drawing 3 about the image formation process of the image formation equipment of the electrophotography method which used the developer of above-mentioned this example.

[0031] In drawing 3, the photo conductor drum 101 rotates with the peripheral speed of 50mm/second in the direction of a graphic display arrow head, and a photo conductor drum 101 front-face top is first charged uniformly in abbreviation-700V with the electrification roller 10. Next, exposure 11 based on

image information is performed by light emitting devices, such as laser and LED, and an electrostatic latent image is formed on the photo conductor drum 101. At this time, the surface potential of the electrostatic latent-image section was abbreviation-100V.

[0032] The development sleeve 110 used the sleeve with a diameter of 16mm made from aluminum, and the rotational speed was decided by peripheral speed of the above-mentioned photo conductor drum 101, and although it was usually 1 to 4 times the peripheral speed of the photo conductor drum 101, in this example, it was set up twice. The feed roller 112 used the thing with a diameter of 18mm made from urethane sponge, and rotated with the development sleeve 110 and this peripheral speed in the direction of a graphic display arrow head.

[0033] When the toner which the electrostatic latent image formed on the photo conductor drum 101 is an operation of the electric field formed by impressing development bias to the development sleeve 110 from the development bias power supply which is not illustrated, and was supported by the development sleeve 110 adheres to the latent image on the photo conductor drum 101, a visible image is formed and a toner image is formed. With the imprint roller 12, this toner image is imprinted on the record material 13, and it is conveyed by the fixing assembly 14, and it is fixed to it on the record material 13, and it is used as a permanent image.

[0034] The ** toner on the photo conductor drum 101 after imprint process termination is written with a cleaner 15, and the following image formation process is equipped with it. In addition, in this example, the process cartridge by which the developer of above-mentioned this example, the photo conductor drum 101, the cleaner 15, and the electrification roller 10 were connoted in one in the outer frame 16 was used.

[0035] In the above image formation process, although the toner for CLC200 put on the market from CANON SALES CO., INC. as a toner of a developer was used, even if it detached and attached the process cartridge, there is nothing, degradation of a toner did not take place, either, but scattering of a toner was able to obtain the image stabilized for a long period of time. Moreover, although the used toner is a nonmagnetic toner, even if it uses a magnetic toner, it cannot be overemphasized that the same result is obtained.

[0036] In addition, in the 1st example of the above, like the usual developer, although the blowdown prevention sheet 108 for preventing the blowdown of the toner from the lower part of the development container 102 to the exterior caudad of the development sleeve 110 is formed, since it also has the function in which the toner migration prevention sheet 103 mentioned above prevents the blowdown of the toner from the lower part of the development container 102 to the exterior, the blowdown prevention sheet 108 may be removed. Moreover, since grant of the unusual charge to the toner on the development sleeve 110 by this blowdown prevention sheet 108 was lost by removing the blowdown prevention sheet 108, it was checked that degradation of image quality is prevented.

[0037] Next, the 2nd example of the developer by this invention is explained with reference to drawing 4. As a toner (1 component developer) is held in the interior of the development container 102 and the developer of this example is also exposed to opening of the development container 102 in part, the conductive development sleeve 110 is arranged pivotable in the direction of a graphic display arrow head. Furthermore, the feed roller 112 for supplying the toner conveyed by the conveyance means 111 to the development sleeve 110 is held in the development container 102.

[0038] Above the development sleeve 110, the blade 113 which regulates the thickness of the toner currently supported by the development sleeve 110 is arranged. This blade 113 is attached in the development container 102. Moreover, under the development sleeve 110, the blowdown prevention sheet 108 for preventing the blowdown of the toner from the lower part of the development container 102 to the exterior is formed.

[0039] It is made to project to a feed roller 112 side, space between the bottom wall surfaces of a feed roller 112 and the development container 102 is narrowed gradually, and between the bottom wall surfaces of this feed roller 112 and the development container 102 is made to approach in this example, so that the wall surface (base) of the development container 102 bottom which counters the feed roller 112 which supplies a toner to the development sleeve 110 may be seen from a toner restoration side

(right-hand side of drawing) and it may become a wedge shape.

[0040] Thus, if space between the bottom wall surfaces of a feed roller 112 and the development container 102 is narrowed gradually and made to approach, the effectiveness as the toner migration prevention sheet [in / toner condensation is carried out and / the 1st example above-mentioned with the toner itself] 103 with the toner particle same as migration space narrows in the development container 102 will be acquired. It becomes unnecessary therefore, to form the toner migration prevention sheet 103 like the 1st example of the above.

[0041] Moreover, in the configuration of this example shown in drawing 4 , the thickness of a toner layer sets average toner particle size to 10 micrometers, and is about ten layers from three layers, therefore it is [that the distance a between the bottom wall surfaces of a feed roller 112 and the development container 102 should just be a distance which is sufficient for the toners on a feed roller 112 being collected into the development container 102] usually desirable [distance a] to set it as 30 micrometers - 100 micrometers or more.

[0042] In addition, although sufficient effectiveness will be demonstrated and effectiveness will fall a little if a toner is ten - about 1000 pieces as effectiveness of the toner migration prevention sheet 103, what is necessary is just about 3000 pieces from 1000 pieces. In the case of distance a, 2mm is preferably good from 100 micrometers 100 micrometers - 3mm.

[0043] Although the wall surface of the development container 102 bottom which counters a feed roller 112 was made to project to a feed roller 112 side and space between the bottom wall surfaces of a feed roller 112 and the development container 102 was gradually narrowed in the 2nd example of the above so that it might see from a toner restoration side and might become a wedge shape As shown in drawing 5 , even if it constituted the bottom wall surface of the development container 102 stair-like and narrowed gradually (gradually) space between the bottom wall surfaces of a feed roller 112 and the development container 102, it turned out that the same effectiveness as the 2nd example of the above is acquired. Also in this case, distance a is the same as the 2nd example of the above, and is preferably set as 2mm from 100 micrometers 100 micrometers - 3mm.

[0044] Furthermore, as shown in drawing 6 , even if it made it the configuration where made high the bottom wall surface (base) of the development container 102, and the peripheral face of this feed roller 112 was mostly met in the part of a feed roller 112 and narrowed gradually space between the bottom wall surfaces of a feed roller 112 and the development container 102, it turned out that the same effectiveness is acquired.

[0045] In this case, the feed roller 112 of the upstream in the hand of cut of a feed roller 112 and distance a between the bottom wall surfaces of the development container 102 are set to 3mm from 100 micrometers on the basis of the point of contact of a feed roller 112 and the development sleeve 110. When distance was enlarged gradually and the feed roller 112 of the downstream and the distance b between the bottom wall surfaces of the development container 102 were most set as 101 micrometers or more about 10mm according to the distance a of the upstream as it went to the downstream, the same effectiveness as the 2nd example of the above was acquired. In addition, as for the distance for a points and b points, it is desirable that it is 10mm or more.

[0046] Next, the 3rd example of the developer by this invention is explained.

[0047] Drawing 7 is the outline sectional view showing the 3rd example of the developer by this invention with a photo conductor drum. The developer of this example also equips the part which counters the photo conductor drum 101 with the development container 102 which has opening, and a toner (1 component developer) is held in the interior of this development container 102 so that it may illustrate. Moreover, as it exposes to the above-mentioned opening in part, the conductive development sleeve 110 is arranged pivotable in the direction of a graphic display arrow head at the development container 102.

[0048] The development sleeve 110 sets the photo conductor drum 101 and a 50-500-micrometer gap, and is held, and the development field for turning to the photo conductor drum 101 the toner currently supported by the development sleeve 110, and supplying it is formed. Furthermore, the feed roller 112 for supplying the toner conveyed by the conveyance means 111 to the development sleeve 110 is held in

the development container 102.

[0049] The development bias voltage which superimposed direct current voltage and alternating voltage from bias power supply 106 at the time of development actuation is impressed to the development sleeve 110.

[0050] Above the development sleeve 110, the blade 113 which regulates the thickness of the toner currently supported by the development sleeve 110 is arranged. This blade 113 is attached in the development container 102. Moreover, under the development sleeve 110, the blowdown prevention sheet 108 for preventing the blowdown of the toner from the lower part of the development container 102 to the exterior is formed.

[0051] The flexible magnetic film 122 is attached in the wall surface (base) of the development container 102 bottom which arranges a magnet 121 in the interior of the feed roller 112 which supplies a toner to the development sleeve 110, and fixes to it as a field generating means, and counters with a feed roller 112 in this example. Here, the magnetic film 122 attaches that base in the part by the side of the development sleeve 110 of a development container bottom wall surface, in order to make it that point contact this feed roller 112 in the mode along the hand of cut of a feed roller 112 so that it may illustrate, when magnetically drawn in by the magnet 121.

[0052] A magnetic stainless steel foil, a nickel foil, the alloy foil of nickel and iron, etc. are sufficient as the above-mentioned magnetic film 122, the thickness is 10 micrometers to about 200 micrometers, and it should just be the ingredient to which it can stick by the field from the above-mentioned magnet 121. Moreover, vacuum evaporation or the thing which carried out the coat may be used in the above-mentioned metal material at resin ingredients, such as PET (polyethylene terephthalate) and PVdF (polyvinylidene fluoride). Furthermore, although the magnetism from a magnet 121 is based on the ingredient of the magnetic film 122, what is necessary is just within the limits of 50 to 1000 gauss on the front face of a feed roller 112.

[0053] The above-mentioned magnetic film 122 is always attracted by the magnet 121 fixed to the interior of a feed roller. Since it is in contact with the front face of a feed roller 112 and the point is forced on a feed roller 112, when the toner in the development container 102 tends to move in the developer blowdown prevention sheet 108 direction, The toner in the development container 102 cannot pass along the space A separated with the magnetic film 122 between a feed roller 112 and a development container bottom wall surface, but it becomes impossible to move in the blowdown prevention sheet 108 direction. Moreover, a toner is not accumulated in Space A.

[0054] Since it is in contact with the feed roller 112 in the mode which the above-mentioned magnetism film 122 mentioned above even if it vibrated the development container 102, as the development sleeve 110 was caudad turned as shown in drawing 8 on the other hand, and an arrow head D showed, as the arrow head C in drawing shows the toner in the development container 102 with gravity, it goes into the magnetic film 122, and the point of this magnetism film 122 is forced on a feed roller 112. Therefore, the development container 102 will be in the condition were divided by the feed roller 112 and the magnetic film 122, and will not produce at all the fault which the toner in the development container 102 cannot pass through the space A between the bottom wall surfaces of a feed roller 112 and the development container 102, but reaches the blowdown prevention sheet 108, and is made to transform this sheet 108, and the fault of a toner dispersing from the development container 102 and soiling a perimeter.

[0055] Therefore, since it does not join the development sleeve 110 or a feed roller 112 with an unusual working pressure with the condensation of a toner or are recording toner accumulated in this Space B and space A between the bottom wall surfaces of a feed roller 112 and the development container 102, without accumulating a toner in the about 108 blowdown prevention sheet space B while degradation of a toner is prevented, the fault of degrading image quality is also removable.

[0056] The toner which remained on the feed roller 112, without carrying out a deer, and the toner which is not contributed to development on the development sleeve 110 being stripped off by the feed roller 112, and being applied to the development sleeve 110 is returned into the development container 102 with this stripped-off toner. In this case, in the developer of this example, since it was set up within

the limits of 50 to 1000 gauss as the magnetism of a magnet 121 mentioned above, all the toners on a feed roller 112 depressing the point of the above-mentioned magnetic film 122, and being returned into the development container 102 was checked. For this reason, the about 108 blowdown prevention sheet space B and the space A between the bottom wall surfaces of a feed roller 112 and the development container 102 are not covered with a toner, therefore degradation of a toner is not caused.

[0057] Next, it explains, raising a concrete numeric value with reference to drawing 9 about the image formation process of the image formation equipment of the electrophotography method which used the developer of above-mentioned this example.

[0058] In drawing 9, the photo conductor drum 101 rotated with the peripheral speed of 50mm/second in the direction of a graphic display arrow head, and the photo conductor drum 101 front-face top was first charged uniformly in abbreviation-700V with the electrification roller 10. Next, exposure 11 based on image information was performed by light emitting devices, such as laser and LED, and the electrostatic latent image was formed on the photo conductor drum 101. At this time, the surface potential of the electrostatic latent-image section was abbreviation-100V.

[0059] The development sleeve 110 used the sleeve with a diameter of 16mm made from aluminum, and the rotational speed was decided by peripheral speed of the above-mentioned photo conductor drum 101, and although it was usually 1 to 4 times the peripheral speed of the photo conductor drum 101, in this example, it was set up twice. The feed roller 112 used the thing with a diameter of 18mm made from urethane sponge, and rotated with the development sleeve 110 and this peripheral speed in the direction of a graphic display arrow head.

[0060] By impressing development bias to the development sleeve 110 from the development bias power supply which does not illustrate the electrostatic latent image formed on the photo conductor drum 101, the toner supported by the development sleeve 110 adhered to the latent image on the photo conductor drum 101, this latent image was formed into the visible image, and the toner image was formed. With the imprint roller 12, this toner image was imprinted on the record material 13, and it was conveyed by the fixing assembly 14, and it was fixed to it on the record material 13, and it was used as the permanent image.

[0061] The ** toner on the photo conductor drum 101 after imprint process termination is written with a cleaner 15, and the following image formation process is equipped with it. In addition, in this example, the process cartridge by which the developer of above-mentioned this example, the photo conductor drum 101, the cleaner 15, and the electrification roller 10 were connoted in one in the outer frame 16 was used.

[0062] In the above image formation process, although the toner for CLC200 put on the market from CANON SALES CO., INC. as a toner of a developer was used, even if it detached and attached the process cartridge, there is nothing, degradation of a toner did not take place, either, but scattering of a toner was able to obtain the image stabilized for a long period of time. Moreover, although the used toner is a nonmagnetic toner, even if it uses a magnetic toner, it cannot be overemphasized that the same result is obtained.

[0063] In addition, in the 3rd example of the above, like the usual developer, although the blowdown prevention sheet 108 for preventing the blowdown of the toner from the lower part of the development container 102 to the exterior caudad of the development sleeve 110 is formed, since it also has the function in which the magnetic film 122 mentioned above prevents the blowdown of the toner from the lower part of the development container 102 to the exterior, the blowdown prevention sheet 108 may be removed. Moreover, since grant of the unusual charge to the toner on the development sleeve 110 by this blowdown prevention sheet 108 was lost by removing the blowdown prevention sheet 108, it was checked that degradation of image quality is prevented.

[0064] Drawing 10 is the outline sectional view showing the 4th example of the developer by this invention. Although the magnet 121 was fixed to the interior of a feed roller 112 in the 3rd example of the above, as shown in drawing 10, the revolution magnet 131 magnetized by turns is arranged in the interior of a feed roller 112 by this example.

[0065] This revolution magnet 131 carries out magnetic attraction of the point of the magnetic film 122

attached in the bottom wall surface of the development container 102 in the above-mentioned mode, and contacts the front face of a feed roller 112. Since an about 122 magnetic film toner is unfolded and are recording of the toner in the development container 102, condensation, etc. are prevented in order to vibrate this magnetic film 122 by the mutual field while fixing In addition to the advantage of the 3rd example of the above, there is an advantage that degradation of a toner can be prevented further. In addition, other configurations give the same sign to the 3rd example of the above, the components which correspond since it is substantially the same, a member, a component, etc., and omit the explanation. [0066] Although the field generating means was arranged in the interior of a feed roller 112 in the 3rd and 4th examples of the above, even if it constitutes the interior or the front face of a feed roller 112 from magnetic material and magnetizes the magnetic film 122, it cannot be overemphasized that the same operation effectiveness is acquired.

[0067] Moreover, magnetic powder etc. may be diverted instead of the magnetic film 122. Furthermore, although it is immobilization as a field generating means or the rotating permanent magnet was used, of course, an electromagnet and other field generating means may be used. Moreover, the thing which distributed magnetic powder inside resin, or the thing formed in the shape of a foil with the superconductor can be used in addition to what formed the magnetic foil on a magnetic metal or resin as a magnetic film 122.

[0068] Next, the 5th example of the developer by this invention is explained with reference to drawing 11 . In addition, the same sign is attached and explained to each above-mentioned example, corresponding components, a member, and a component.

[0069] As shown in drawing 11 , in this example, a power source 21 is connected with a feed roller 112 between the development sleeves 110, and an electrical potential difference which is drawn by the toner from the development sleeve 110 to a feed roller 112 side is impressed from this power source 21.

[0070] If a concrete numeric value is raised and it explains further, the development sleeve 110 is a product made from aluminum, and that front face is made into irregularity by making the technical abrasive grain known conventionally collide with this front face. Moreover, a diameter is 16mm and revolution actuation is carried out with the peripheral velocity of per second 150mm. A feed roller 112 is 16mm in diameter, and makes the polyurethane rubber which made the front face of a metal roller with a diameter of 12mm distribute carbon 5% foam by 2mm in thickness. Revolution actuation of this feed roller 112 is carried out with the peripheral velocity of per second 100mm.

[0071] In the above configuration, by impressing the direct current voltage of V, all the toners on the 400 development sleeve 110 after passing through the development field which stands face to face against the photo conductor drum 101 were stripped off between the development sleeve 110 and the feed roller 112 at the feed roller 112 side, and were able to be removed from the power source 21. Under the present circumstances, the toner for alphaCLC500 put on the market from CANON SALES CO., INC. as a toner of a developer was used. Since this toner was negative(-) electrification nature, all the toners on the development sleeve 110 were removable by connecting the positive electrode (+) of a power source 21 to a feed roller 112 so that it may illustrate, and connecting a negative electrode (-) to the development sleeve 110. When using the toner (+ polarity) of reverse electrification nature, it cannot be overemphasized that what is necessary is just to make the impression polarity of the above-mentioned power source 21 into reverse.

[0072] Drawing 12 is the outline block diagram showing the 6th example of the developer by this invention. This example is what improved further the feed roller 112 in the 5th example of the above shown in drawing 11 , and it is spacing predetermined to a circumferencial direction about cylindrical or the sleeve-like electrode 22, and it uses two or more shafts of the development sleeve 110 and things which arranged in parallel mostly became independent electrically in the polyurethane rubber of the front face of a metal roller as a feed roller 112.

[0073] A deer is carried out, on the basis of the contiguity section or the contact section of the development sleeve 110 and a feed roller 112, the conductor 23 of the shape of 1 or radii which contacts electrically two or more (this example nine electrodes) of the electrode 22 of the downstream of the hand of cut of a feed roller 112 is arranged, and it fixes, and between this conductor 23 and the

development sleeve 110, a power source 21 is connected and a predetermined electrical potential difference is impressed.

[0074] According to the configuration of above-mentioned this example, all the toners on the development sleeve 110 after passing through the development field which stands face to face against the photo conductor drum 101 were stripped off at the feed roller 112 side, and were able to be removed. Moreover, since [whose electrode 22 of a feed roller 112 is predetermined] it stopped contacting a conductor 23 when an include-angle revolution is carried out, the toner which was stripped off and adhered to the feed roller 112 was certainly released within the development container 102, therefore it became easy for a toner to circulate, and the result still more desirable than the case where it is the 5th example of the above was obtained.

[0075] In addition, other configurations give the same sign to the 5th example of the above, the components which correspond since it is substantially the same, a member, a component, etc., and omit the explanation.

[0076] Drawing 13 is the outline block diagram showing the 7th example of the developer by this invention. This example is what improved further the 6th example of the above shown in drawing 12 , and it arranges and fixes the 2nd tabular electrode 24 to the bottom wall surface of the development container 102, and it impresses a predetermined electrical potential difference from a power source 21 so that it may be drawn by the toner from this 2nd electrode 24 to a feed roller 112 side, so that it may counter with a feed roller 112. In addition, other configurations give the same sign to the 5th example of the above, the components which correspond since it is substantially the same, a member, a component, etc., and omit the explanation.

[0077] According to the configuration of above-mentioned this example, all the toners on the development sleeve 110 after passing through the development field which stands face to face against the photo conductor drum 101 were stripped off at the feed roller 112 side, and were able to be removed. Moreover, since the toner on this 2nd electrode 24 also adheres to a feed roller 112 side, therefore an unnecessary toner does not adhere to the development container 102, since the electrical potential difference mentioned above also to the 2nd electrode 24 is impressed, and a toner is not accumulated, a toner leak and toner scattering can also be prevented to condensation of a toner, and a pan.

[0078] What is necessary is to be usually about 1-5mm, and just to impress the electrical potential difference of the range of 100V to 500V per mm, although the electrical potential difference impressed to the 2nd electrode 24 of the above is decided by distance between the development container 102 and a feed roller 112. In this example, the same potential as the development sleeve 110 was impressed to the 2nd electrode 24, and the above-mentioned desirable result was obtained so that it might illustrate.

[0079] Furthermore, as shown in drawing 14 , when the 2nd electrode 24 was extended to the development sleeve 110 and the location which counters, it was checked that there is much more effectiveness in prevention of a toner leak, toner scattering, etc. rather than the 7th example of the above. What is necessary is just to give the electric field by which an electrical potential difference is impressed from the separate power source 25 to the 2nd electrode 24, and a toner goes to a development sleeve 110 and feed roller 112 side in the configuration of drawing 14 .

[0080] Moreover, although the 2nd electrode 24 was extended in drawing 14 to the development sleeve 110 and the location which counters, an electrode 24 may be made only into the magnitude which counters a feed roller 112 as shown in drawing 13 (it does not extend to the location of the development sleeve 110), and it may arrange a separate tabular electrode in the bottom wall surface of the development container 102 so that it may counter with the development sleeve 110. In this case, what is necessary is just to impress an electrical potential difference to two electrodes which became independent, respectively, so that a toner may go to the feed roller 112 and the development sleeve 110 which counter from each electrode.

[0081] In addition, although each above-mentioned example explained the case where this invention is applied to the photo conductor drum 101 and the developer which adopted the non-contact developing-negatives method the development sleeve 110 had countered in the state of non-contact, it cannot be overemphasized that this invention can apply also to the photo conductor drum 101 and the developer

which adopted the contact developing-negatives method the development sleeve 110 had countered in the state of contact, and the operation effectiveness equivalent to each above-mentioned example is acquired. Moreover, if it is the developer which has a feed roller, of course, this invention is applicable also to the developer which uses magnetic 1 component developer (toner).

[0082] Furthermore, although this invention was applied to the developer currently used for the image formation equipment of an electrophotography method in each above-mentioned example, it cannot be overemphasized that this invention is applicable also to the developer currently used for image formation equipments other than an electrophotography method. moreover, it cannot be overemphasized that it does not pass over each example mentioned above to mere instantiation of this invention, therefore structures, such as a configuration of a developer, a member to be used, components, and a component, a configuration, a dimension or the configuration of an electrode, a dimension, the connection mode of a power source, etc. are not limited to the thing of an example, but the need is accepted, and it can deform and change into versatility.

[0083]

[Effect of the Invention] As explained above, the developer by this invention Since the developer migration prevention member was prepared between the wall surfaces which the developer supply means in the downstream of the hand of cut of this developer supply means and a development container counter from the contact section or the contiguity section of developer support and a developer supply means This developer migration prevention member can take up between the wall surfaces which a developer supply means and a development container counter, and it can prevent certainly that a developer moves in the direction of the container exterior through between the wall surfaces which this developer supply means and a development container counter. Therefore, even if it turns developer support caudad and vibrates a development container, by the developer migration prevention member, a developer cannot pass through between the wall surfaces which a developer supply means and a development container counter, but can remove thoroughly the fault made to reach and deform into a blowdown prevention sheet, and the fault that a developer disperses from a development container and soils a perimeter. Moreover, since a developer is not accumulated in the space near the blowdown prevention sheet, while degradation of a developer is prevented Since it does not join developer support with an unusual working pressure, or a developer supply means with condensation of this space, a developer supply means, and the developer accumulated in the space between the wall surfaces which a development container counters, or an are recording developer The fault of degrading image quality can also be removed and the effectiveness that the image which carried out rear-spring-supporter stability can be obtained is in a long period of time.

[0084] The developer by this invention moreover, between the wall surfaces which the developer supply means in the downstream of the hand of cut of this developer supply means and a development container counter from the contact section or the contiguity section of developer support and a developer supply means Since the magnetic-thin-film member which counters a field generating means and this was prepared, a magnetic-thin-film member takes up with the magnetic adsorption power by the field generating means between the wall surfaces which a developer supply means and a development container counter. It can prevent certainly that a developer moves in the direction of the container exterior through between the wall surfaces which this developer supply means and a development container counter. Therefore, even if it turns developer support caudad and vibrates a development container, by the magnetic-thin-film member, a developer cannot pass through between the wall surfaces which a developer supply means and a development container counter, but can remove thoroughly the fault made to reach and deform into a blowdown prevention sheet, and the fault that a developer disperses from a development container and soils a perimeter. Moreover, since a developer is not accumulated in the space near the blowdown prevention sheet, while degradation of a developer is prevented Since it does not join developer support with an unusual working pressure, or a developer supply means with condensation of this space, a developer supply means, and the developer accumulated in the space between the wall surfaces which a development container counters, or an are recording developer The fault which degrades image quality can also be removed and the effectiveness

that the image which carried out rear-spring-supporter stability can be obtained is in a long period of time.

[0085] Furthermore, since the developer by this invention formed electric field which a developer moves to a developer supply means side from developer support, all the developers on the developer support after passing through image support and the development field which counters are stripped off at a developer supply means side, and can be thoroughly removed from developer support. For this reason, since neither the fault in which a ghost image is formed by the developer which is not moved on developer support, nor fogging of the image by scattering of a developer and degradation is produced, the effectiveness that the image which carried out rear-spring-supporter stability can be obtained is in a long period of time. Since a developer is moreover stripped off from developer support in an operation of electric field, the contact pressure of developer support and a developer supply means does not need to apply big contact pressure it is [the contact pressure with small extent which contacts lightly] enough it, and sufficient to strip off a developer mechanically from developer support like before. Therefore, it is effective in the life of developer support or a developer supply means becoming long.

[Translation done.]